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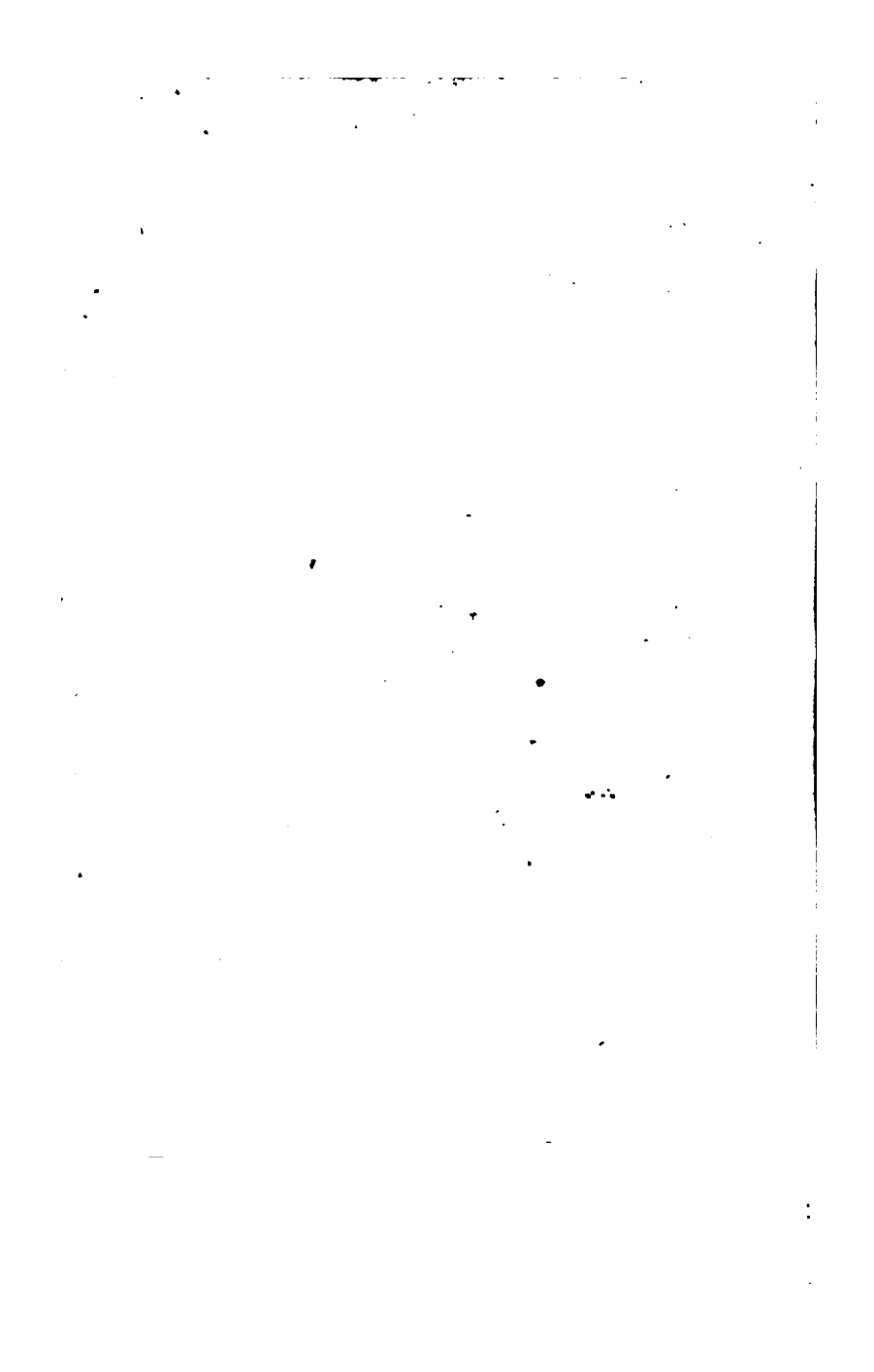
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THE
MINERAL WATERS
OF
AIX-LES-BAINS & MARLIOZ

LÉON BLANC

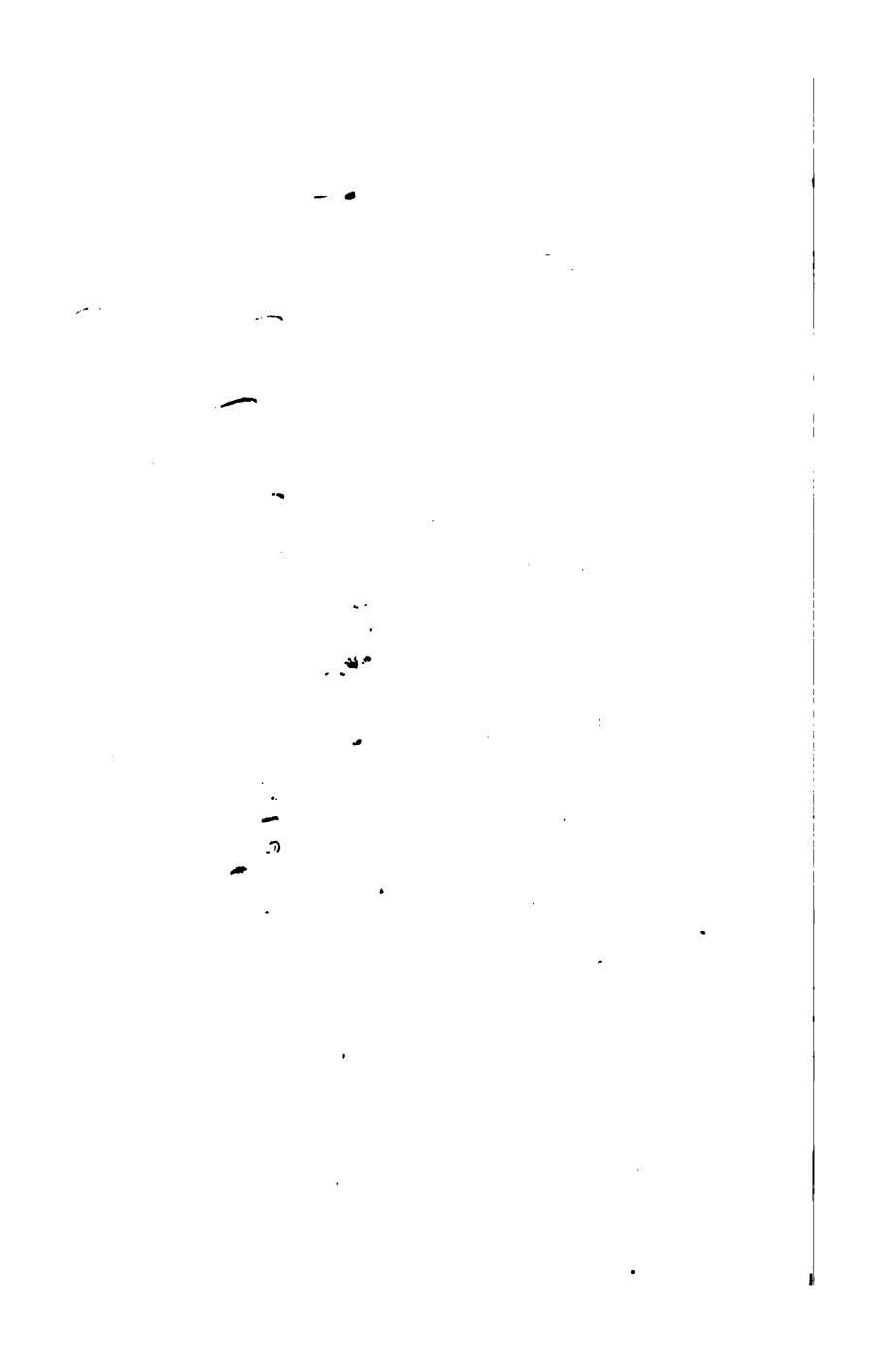




THE MINERAL WATERS

OF

AIX-LES-BAINS AND MARLIOZ



THE MINERAL WATERS

OF

AIX-LES-BAINS AND MARLIOZ

*PRACTICAL CONSIDERATIONS ON THEIR
ACTION AND APPLICATION*

BY

LÉON BLANC, M.D. (PARIS)

*Knight of the Crown of Italy;
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LONDON

J. & A. CHURCHILL

11, NEW BURLINGTON STREET

1883.

151. 0. 537



PREFACE.

IN offering this little work to English Physicians, it is not with the view of giving a complete history of the maladies or affections treated at Aix, which, indeed, would be a task difficult of execution, as it would expose the writer to frequent repetitions, and needlessly fatigue the readers. It would be necessary, in fact, to take up each malady separately, and indicate the treatment to be employed in every special case.

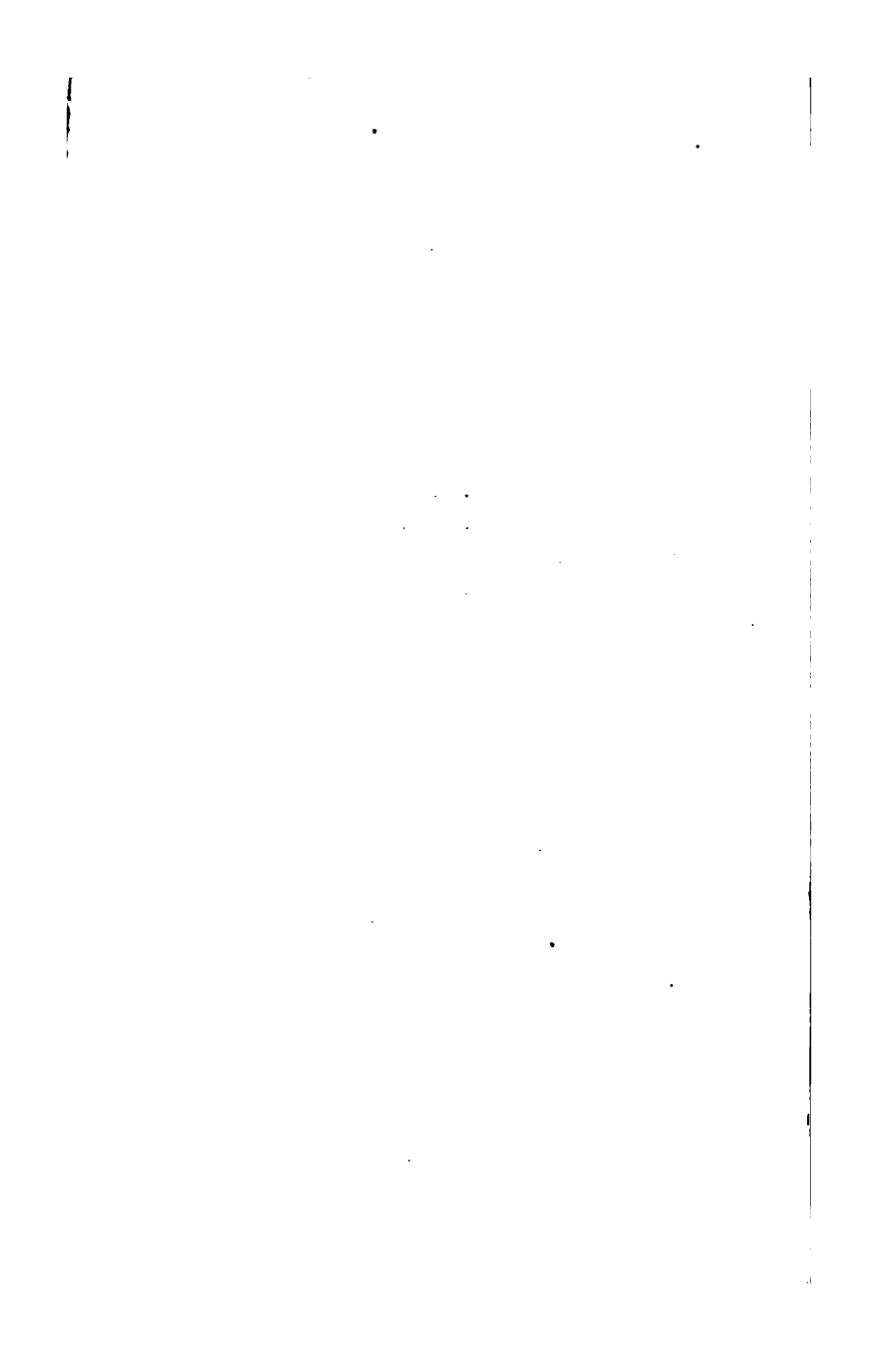
I have, above all, endeavoured to show, in as succinct a manner as possible, the physiological action of the waters of Aix, and the complete system of administering them. I have appended to this study remarks on the application of the waters in the different disorders treated at Aix. These are the results of an experience of fifty

years, which I have wished to condense in as few lines as possible. This little summary will, I hope, be received by my English colleagues with the same kindness and indulgence that I received from them during my sojourn in their country.

AIX-LES-BAINS, *June*, 1883.

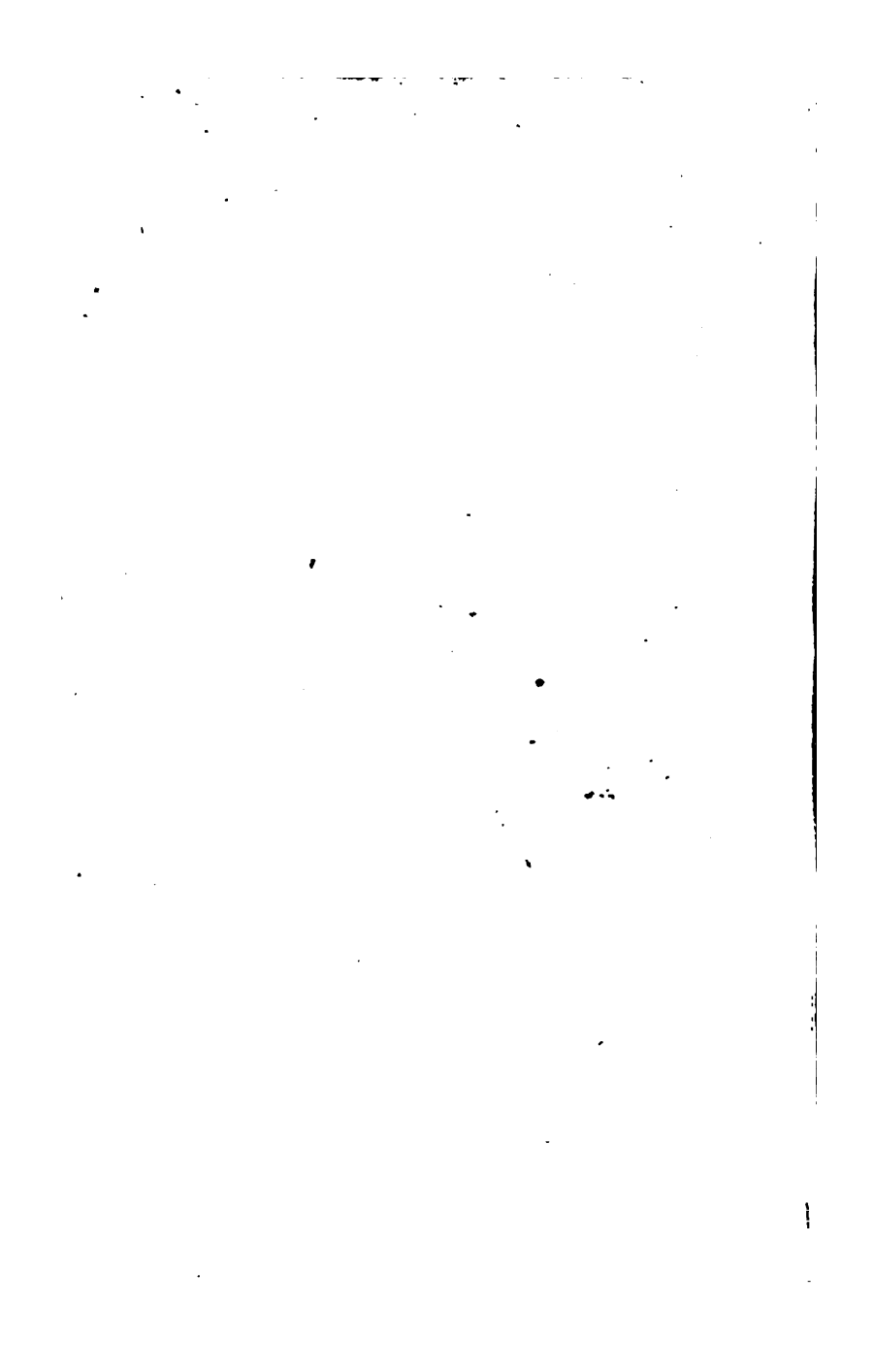
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bule d'entree (Main Hall) first floor



THE MINERAL WATERS

OF

AIX-LES-BAINS AND MARLIOZ



AIX-LES-BAINS.

THE town of Aix-les-Bains (Department of Savoy, District of Northern Chambéry) is situated in one of the most picturesque valleys of the Alps, near Lake Bourget, in the vicinity of Lake Annecy, being distant one half-hour from Chambéry, three hours from Geneva, eight hours from Turin, and twelve hours from Paris.

It enjoys a mild and temperate climate, the air being so pure and the water so good that goitre is unknown, contrary to what takes place in other Alpine valleys, and according to Dr. Francis, is especially suitable for diseases of the chest, the average temperature being 10° C. (50° Fahr.).

Its medical history is of ancient origin, for, besides the Temple of Diana, the Arch of Campanus, the Roman baths and monuments—which

latter still exist—traces of numerous baths, swimming-baths, stoves, and Latin inscriptions have been found while digging for the foundations of the new baths, showing that under the Roman Government the thermal establishment was highly important.

At this time the town was named successively *Aquæ*, *Aquæ Allobrogorum*, *Aquæ Domitiæ*, *Aquæ Gratianæ*.

After the invasion of the barbarians, Aix disappeared momentarily from history, the next mention of it being in the sixth century, at the time of the cession of the Counties of Savoy and Maurienne by Rodolphe, King of Burgundy, to Berold of Saxony.

It is mentioned by various authors writing upon mineral waters between the years 1000 and 1779, the latter being the date of the construction of the Establishment during the reign of Victor Amédée III.

In 1571 Epidiamus, in his book on the Thermal Baths, says, in speaking of those at Aix —“ Truly a royal bath, as much for its splendour, for its beautiful galleries which one sees on all sides, as well as for its fine sculptured building.”

This bath, which was probably a Roman relic, was destroyed by the terrible fire of 1739.

In 1660, King Henry IV. stopped at Aix, taking the baths, in commemoration of which event the establishment was named 'The Bath of Henry IV.' At the same time Dr. Cabias, in his work entitled *The Wonderful Powers of the Baths of Aix in Savoy*, speaks of the marvellous cures obtained by the use of its waters, and of the pleasure the Princes of Savoy took in these salutary baths.

It is to a Prince of Savoy, Victor Amédée III., that we have to ascribe the honour of building, in 1772, according to the plans of the celebrated architect, De Rubiland, the Thermal Palace, which was so well arranged that it has served as a guide for all subsequent constructions.

This building was considerably enlarged and almost completely renewed by the engineer, S. François, and the architect, Pellegrini, from the year 1856 to 1861.

A fresh department, the refrigerated mineral baths, and large reservoirs for collecting the thermal water, which was otherwise lost during the night, were added from 1870 to 1880.

But on account of the ever-increasing number

of bathers, a new wing (*Annexe Sud*) was constructed in 1881-1882, under the direction of Mr. Levy, engineer, and Mr. Revel, architect. Many important improvements were also made in the interior of the old building.

It is the combination of all these successive enlargements which constitute the *Thermal Establishment of Aix*, one of the most renowned in Europe, not only on account of its size, but for the number and variety of its apparatus.

THERMAL ESTABLISHMENT.

THE Thermal Establishment of Aix-les-Bains is situated in the eastern part of the town, at an altitude of 262 metres above the level of the sea. It is divided into three blocks of buildings, corresponding to the three principal extensions which were made in 1776, 1859 and 1881; and it is at the back of a hill, and divided into three successive storeys or terraces, which have been utilized for the application of the waters.

It is composed of *douches, bath-rooms, swimming baths, vapour baths, halls of inhalation, halls of pulverization, and drinking fountains*, which deserve a special description.

Baths.—The bath-rooms are forty-eight in number, supplied from the two thermal sources and cold water. The baths may be given from a minimum temperature of 14° C. (57° Fahr.) to the maximum temperature of 43° C. (108° Fahr.).

Eight bath-rooms are supplied by the refrigerated mineral water, so that baths may be given with the mineral water alone, without the addition of cold water, from a temperature of 16° C. (61° Fahr.).

Eight bath-rooms are annexed to douche cabinets, and permit the douches and the baths to be given successively.

The swimming baths are six in number, two of which are very large, and four smaller. Two of these baths are more especially devoted to children of both sexes; they may, at hours arranged, be hired by families.

Each of these swimming baths is supplied with a cold douche, which is frequently used for the maladies treated at Aix.

Their temperature is always 35° C. (95° Fahr.). There are separate and comfortable dressing-rooms.

Douches.—These are fifty-one in number.

1°. *Ground floor, or Soubassement.*

14	Douches des Princes, with two doucheurs	14
2	Douches à colonne, with one doucheur	2
2	Douches en cercle and de siège	2
4	Douches d'enfer, with one doucheur	4

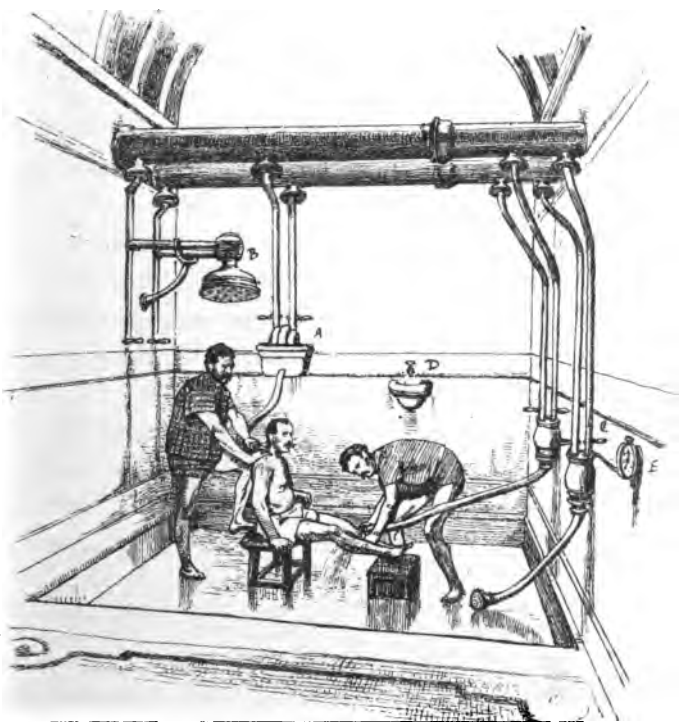
2°. *First floor.*

9	Douches des Princes, with two doucheurs	9
1	Douche moyenne	} with one doucheur . . . 12
4	Douches des albertins	
4	Douches du centre	
3	Douches locales	

2°. *Second floor.*

4	Douches moyennes, with one doucheur	4
4	Douches des Princes, with two doucheurs	4

Total 51



Grande douche des Princes.

A. Boite de mélange.

B. Appareil de grande chute

D. Buvette.

C. Gilotte ou jumelle.

E. Moanometer.

The different names given to the douches are of little importance ; they recall either their primitive application, or the divisions which they occupy, but they serve to guide the physician in the choice which he wishes to make of this or that douche, according to the objects which he has in view.

These douches are divided into two categories : douches supplied by the thermal water alone, and douches supplied by thermal and cold water.

The first are eight in number, and comprise the centre douches and the douches d'enfer.

The others, to the number of forty-three, comprise all the rest.

In general the douche is formed of a basin 3 metres long, and 2 metres 80 centimetres wide.

They are more or less sunk beneath the floor, from 20 centimetres to 1 metre, thus allowing a douche and a bath to be given at the same time. All the douches are provided with dressing-rooms.

The Apparatus for the Douche is :—

- 1°. Une boîte de mélange.
- 2°. Une culotte ou jumelle.
- 3°. Un appareil de grande chute avec une pomme d'arrosoir.
- 4°. Une buvette.

1. The *Boite de Mélange* is a receptacle 40 centimetres in length, 30 in width, and 30 in depth. The water is conveyed by a tube curved like a swan's neck, divided at its upper extremity to receive the hot and the cold water. The mixture is made at first in the curvature, and is completed in the mixing-box, so as to remain invariable, and always give the same temperature.

This apparatus is placed at 1 metre 65 centimetres from the ground, and 92 centimetres from the jumelle; it is terminated by a tube, which serves to pour the water on the patient.

The water from this apparatus serves exclusively for the upper part of the body and the back; directed on the patient by the doucheur, in the douche with two doucheurs; it reaches him by a special arrangement called *corbin* for the douche with a single doucheur. The height, 1 metre 95 centimetres, being invariable for all the douches, it follows that the water reaches all the essential parts of the organism, with a very feeble pressure which cannot vary, at whatever floor of the building the douche is placed.

This arrangement is of considerable importance; by it we avoid any pressure which is too strong, and consequently every danger for the organs

often affected in the cases of rheumatism, so frequently treated at Aix.

2. The *Culotte ou Jumelle* is an oblong box of copper, in which is made the mixture of the hot and cold water conveyed by two isolated tubes ; it is terminated at its lower extremity by a single tube, which serves to guide the water on the patient.

In the *Annexe Sud* every jumelle is provided with a manometer, which permits the pressure of the water to be graduated according to the precise directions of the physician.

In this apparatus, contrary to what takes place with the *boite de mélange*, the water comes at full pressure, which varies according to the floor of the building occupied by the douches, and thus permits numerous applications to be made. This pressure is 14 metres for the ground floor (*soubassement*), 9 metres for the first floor, 6 metres for the second floor.

3. *Un Appareil de Grande Chute* (shower bath), supplied with hot and cold water. The mixture is made by means of an apparatus in the form of a ball ; this may be replaced by a tube to give the *vertical douche*. The water for this apparatus has the same pressure as that of the water from the jumelle.

4. *Une Buvette*.—A fountain with cold water.

The different apparatus being thus arranged, the patient is placed between the *boite de mélange* and the *jumelle*, and receives on the upper part of the body the water which comes from the *boite de mélange*; the water intended for the legs and the lower part of the body comes from the *jumelle*, or the shower tube. It is directed on the limbs by two *doucheurs*, in some *douches* by one alone, whose *hands accompany the water* when applying the shampoo or *massage*. The patient is consequently placed under a stream of thermal water, coming with a pressure and a temperature graduated according to the medical directions, and is shampooed, or *massé*, at the same time by this water, which strikes him, and by the hands of the *doucheurs*, which operate with the water; every part of the body is successively *massé* by this means.

After the massage the patient may receive the water either hot or cold, or hot and cold alternately.

The combination of all these operations constitutes the *douche d'Aix*, which has acquired so great a reputation throughout the world, and is only to be found at Aix.

The good effect of this douche is greatly facilitated by the very nature of the water, which, being exceedingly rich in *glairine* and inorganic matters, is very unctuous, and permits the massage and the frictions without the skin's experiencing the slightest disturbance. If we now consider what importance the massage has assumed in painful affections, in muscular stiffness and in anchylosis, we shall understand all the value, in every affection resulting from arthritism, of a treatment in which the mechanical element is added to the action of the thermal water, already so active in itself.

The *last* medical indication springs from the different configuration of all these douches. Some—douches d'enfer, douches du centre, douches moyennes, douches des albertins and douche des Princes vieux—are hermetically closed; others—douches des soubassements—communicate with the dressing-rooms; others again—douches des Princes, douches de l'annexe—communicate directly with the external air by large openings placed in the upper part; thus giving the physician the facility of choosing this or that division, according to his desire to give a douche more or less aërated, more or less charged with sulphurous

vapour. To six of these douches are annexed bathing-rooms, so that the douches and the baths can be taken without change of place ; six douches have also a vapour bath, called *bouillon*, which is taken either before or after the general douche, according to the direction of the physician.

The services rendered by these vapour baths, or bouillons, in the bathing at Aix are considerable, and demand for an instant the attention of the medical man. In fact, if we examine the composition of the Aix waters, we see that the principal agent in their mineralization is sulphuretted hydrogen ; it is therefore quite natural to seek in the vapour of these waters the modifying, and even the healing elements. Thus, our forefathers, attaching great importance to the use of the sulphurous vapour, had multiplied the applications of it. The old establishment comprised two vapour baths *à l'enfer*, two *au centre*, and six *au vaporarium*. When the cold water was added to the douches, the vapour baths fell for a moment in discredit, so that in the new part of the establishment, created in 1859, there were only two new *bouillons*.

Was this disfavour well deserved ? I think not. Many of my colleagues share my opinion.

The *Medical Society of Aix*, while recognizing the considerable services afforded by the introduction of the cold water, which allowed the giving of tempered douches, frequently affirmed in its different reports the utility of the vapour, urging at the same time the improvement and enlargement of the *Bertholet*, the amelioration of the vapourarium, then badly organized, and the establishment of new vapour baths in the southern annexe.

When we consider that the maximum temperature of the vapour baths may be 42° C. (107° Fahr.), and that this temperature may be easily lowered by means of the cold water which is added to all the new vapour baths, we shall be little alarmed at the results which may be obtained by a temperature relatively of little elevation. What might appear barbarous was the very constitution of the old vapour baths, which, placed in a *soubassement* almost completely deprived of light, were a cause of terror and apprehension to the patients. After practising fifteen years in the establishment at Aix, I have become convinced of the utility and necessity of the vapour in certain rheumatic affections.

The vapour douches are divided into two categories—General Douches and Local Douches.

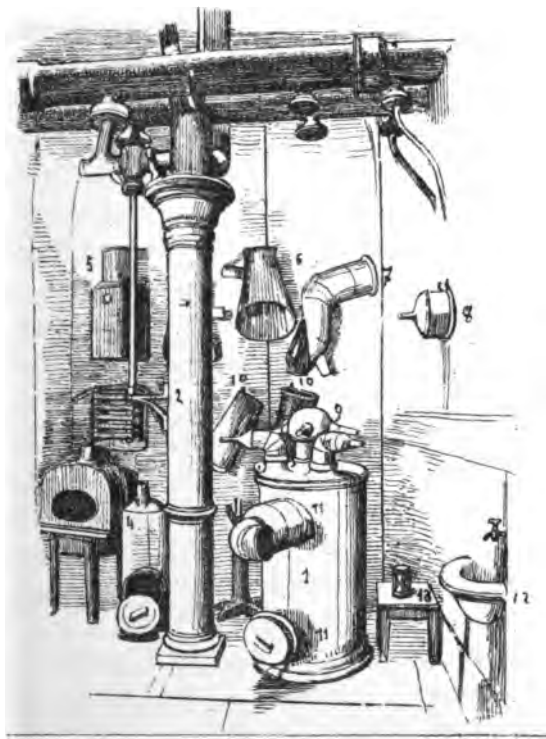
1. **General Vapour Douches.**—They are sixteen in number, thus divided :—

Six *bouillons*—two in the centre division, two in the division du soubassement, two in the southern annexe. These bouillons are annexed to douches, correspond directly with them, and may be used either separately or conjointly with the douche. They are supplied with the thermal water at the initial temperature. The four last have besides, cold water, which permits a modification of temperature according to medical directions.

Eight vapour baths—two à l'enfer, six in the vaporarium. In the first two the patient may at the same time receive the thermal water and be massé ; in the six others the patient is in a vapour bath, with the feet plunged in a bath of mineral water.

Two vapour boxes supplied with the same vapour as that of the Division Bertholet, which forms the subject of special description.

2. **Division Bertholet :** Local Vapour Douches.—These douches are of considerable importance, both on account of the services which they render, and of their special organization at the establishment at Aix. They are six in number—the two boxes of which I have



Apparatus of the Division Bertholet (Local Vapour Baths.)

- | | |
|--|------------------------------------|
| 1. Drum | 10,10, Apparatus for Wrist. |
| 2. Column | 12, Buxette. (Drinking fountain.) |
| 3,4,5. Apparatus for leg, ankle, knee. | 13. Hour-glass. |
| 6,7, , , Shoulders. | 11, Openings for the reception |
| 8,9. , , Throat, ear, eye. | of all the apparatus. |

1

2

3

just spoken, and four local douches, properly so-called, provided with numerous contrivances to carry the vapour to the different parts of the body.

To understand clearly the *modus operandi*, we must have an exact idea of the configuration and position of this establishment.

We have said that this Thermal Establishment abuts against a hill. Two reservoirs of the thermal waters are situated above the establishment ; another is in the establishment itself, on a level with the second storey. The fall of water from the upper reservoir into the lower has been utilized to establish a continuous current of forced vapour, which serves to supply the different douches.

This water from the upper reservoir falls into the lower reservoir in four hollow columns, from a height of 2 metres 80 centimetres, and dashes on discs with prisms placed at the upper part of the latter reservoir. By this fall the water displaces a column of air charged with sulphurous vapour, which endeavours to disengage itself through the openings which it meets. The openings have been arranged so as to be adapted—

1. To the two vapour baths.
2. To special apparatus which distributes the

air surcharged with sulphurous vapour over the different organs or members of the human body, without exposing the patient to the general action of the vapour.

3. To four drums furnished with caoutchouc tubes, which convey the vapour to the throat, the lungs, the eyes and the ears. These drums are placed in such a manner that the vapour reaches them with a different pressure, but always the same for each drum, thus permitting the establishment of degrees in the treatment, according to the medical directions.

To supply this Division Bertholet there is required every morning a provision of 1,800,000 litres of water—nearly 400,000 gallons.

Therefore, to have so complete a supply, it was necessary to fulfil the three following conditions:—

1. Abundance of water.
2. Water at a temperature of 45° C. (114° Fahr.), yielding vapour easily tolerated by the patient.
3. The possibility of superposition of two reservoirs.

The vapour department comprises also two large halls of inhalation, supplied with thermal

water direct from the source ; one on the second storey, in the Division Bertholet, one on the lower storey, in the southern annexe. To this latter are annexed four foot-baths, with a continuous current of water, useful for the patients whose internal organs are easily liable to congestion.

Lastly, two *salles de pulverization*. They contain eleven sets of apparatus, supplied with sulphurous water direct from the source, two *douches en cercle*, several *bains de siège* and *douches ascendantes*, which require no special remark, but are supplied with thermal and cold water.

Two thermal sources supply these douches, vapour baths, swimming bath, &c. &c., one (called) SULPHUR, the other (called) ALUM. They furnish the enormous quantity of four million litres in twenty-four hours (926,100 gallons), which, added to the cold water, constitute a supply of nearly six millions (1,318,000) gallons.

The chemical composition of the thermal sources varies little, as proved by the last analysis, made by M. Wilm, in 1878, and that made by M. Garigou in the same year ; one indicating the simple elements of the water, the other their probable combinations. M. Bonjean had already arrived at the same result in 1832.

ANALYSIS OF THE MINERAL WATER OF AIX.

By M. WILM.

	Spring known as Sulphur.	Spring known as Alum.	
Temperature . . .	45°5' C.	44°6' C.	
Free sulphuretted hydrogen	} 3·37 to 4·13 mm.	3·74 mm.	
Sulphur under the form of hyposulphite			
Carbonic acid gas	47·15 cc.	44·58 cc.	
(by weight)	0·0932 gramme	0·0882	
Nitrogen	13·03 cc.	12·5 cc.	
Calcic carbonate	0·1894	0·1623	0·1982
Magnesian „	0·0105	0·0196	
Ferric „	0·0010	0·0008	
Silica	...	0·0175	
Total deposit from boiling	0·2009		0·1983
Silica	0·0479	0·0365	
Calcic sulphate	0·0928	0·0810	
Magnesian „	0·0735	0·0493	
Sodic „	0·0327	0·0545	
Aluminic „	0·0081	0·0003	
Sodic chloride	0·0300	0·0274	
Calcic phosphate	0·0076	traces.	
Total constituents remaining in solution }	0·2916		0·2461
Total fixed constituents determined }	0·4925		0·4433

*Sulphur Spring.**Alum Spring.*

Organic matter very changeable.

Lithium	} 0·0050	traces	} 0·0095
Potassium		doubtful	
Strontium		doubtful	
Iodine		traces	

Organic matter of the Water of Aix, or Barégine.

The barégine of Aix, dried at 100°, leaves 50 per cent. of ashes, consisting, in 100 parts, of—

	Silica	37.41
	Alumina	4.86
	Ferric oxide	10.00 (about)
Substances undetermined—	(Hydrochloric acid)	
	Sulphuric ,	
	Carbonic „	11.76
	Magnesia . .	small quantity—none.
		100

In order to utilize all this water, vast reservoirs have been constructed, four in number ; they can hold 2,000,233 litres of water—nearly 500,000 gallons. This explains the abundance of water furnished for each douche. When to all this is added that, during the year, thanks to the liberality of the Government, all these douches, baths, &c., have been considerably improved ; that porcelain and marble replace, or will soon replace, the old plaster, which was becoming spoiled very rapidly ; and that all the appliances have been chosen with the greatest care from new models, we shall understand the importance of an establishment having at its disposal a considerable volume of mineral water, an establishment presenting every variety of douches, administered by skilled doucheurs of the highest reputation, and whose education is perfected from year to year. .

The number of assistants necessary for the

proper working of the establishment is 192 ; this figure is itself sufficient to show the importance of the establishment.

This old and just reputation for excellent administration of the waters is so well accepted by the medical body, that many distinguished colleagues, taking into consideration the weak mineralization of the waters, have had, and still have, the conviction that the marvellous results obtained at Aix must be attributed almost exclusively to the mode of administration. Such is not the case. The study of the physiological action of the waters, taken apart from all mechanical action, will show us their special action, exerting a great modifying power upon the diathesis. This action is also proved by the results obtained ; in fact, the majority of patients come to us only after having taken, in the different towns in which they reside, douches and vapour baths the mechanical action of which is all that can be desired. They experience relief, it is true, but generally they are obliged to come to our *Thermes* for a radical cure.

Moreover, the following are the phenomena which occur in the bath alone, without douche or vapour :—

The first impression of the bather on plunging into a bath of 35° C. (95 Fahr.)—the temperature of the swimming-baths—is a feeling of general comfort; there seems to be an organic alleviation, and the pains have a tendency to disappear, or at least to diminish. No appreciable physiological action is perceived; the pulse and the temperature undergo no modification; the patient leaves the bath satisfied with his first immersion. Two or three hours afterwards the phenomena change; he begins to feel a little lassitude, a little numbness, a sort of torpor, bringing on sleepiness. But sleep does not come; on the contrary, when the patient lies down, he sleeps with difficulty, and when he sleeps is agitated by painful dreams and startled awakenings. At the same time pains begin to be felt; and not only are they experienced where they already existed, but at points also where they had never been manifested.

With nervous persons there is a general excitement, not merely of the nervous system, but also of the whole periphery of the body. They experience sometimes sensations of unusual heat, prickings all over the body; sometimes, in persons with a delicate skin, slight fugitive rednesses

appear, like urticaria. Numbers of bathers, therefore, imagining they take a simple pleasure-bath in our vast swimming baths, find pains arise which they thought had been long extinguished, and which on reappearing indicate the utility and necessity of a complete treatment.

These symptoms vary according to the bathers; they are produced more or less easily, more or less rapidly, but their presence is constant. There is, therefore, a special action due to the thermal water alone, an action the cause of which is not yet ascertained, but which may be produced either by sulphuretted hydrogen or sulphur, or by electric currents established between the bather and the water, which are produced by the decomposition of the different salts in contact with the oxygen of the air.

Scoutetten had already, in 1842, affirmed the considerable development of electricity in the baths of Aix; further experiments have demonstrated the accuracy of the facts which he had advanced.

This last explanation appears all the more correct, as the different phenomena experienced by the bathers resemble very sensibly those produced by a feeble electric current.



Chaise à porteur
(Sedan Chair.)

Comparative experiments made with the waters of Aix and waters artificially mineralized, have proved to me that the symptoms which I have described are really the result of our thermal water, and that they are not due either to heat alone or to mineralization alone.

The phenomena produced in the douches are different. But to understand them well it is necessary to give an exact description of the douche. This is how it is administered :—

The bather being seated on a chair, the water falls on all parts of his body successively, with more or less force or volume, according to the prescription of the physician. Two doucheurs during this time rub his skin, shampoo (or *massent*) all the muscles, and make him move his different joints in every direction. This operation, which lasts from ten to fifteen minutes, being over, the bather is wrapped in a flannel gown, sheet and blanket. Once in this *maillot* as it is called, he is placed in a sedan, conveyed to his house, where a warm bed awaits him, and there is confided to the *sécheur* of the house, who wipes him down, leaves him more or less time in the *maillot*, and gives him some mineral water, or any other beverage to drink, according to the directions.

By this manner of administering the douche, it is seen that the attentions with which the bathers are surrounded at the establishment are continued in their residences.

At other times, after the douche, the bather, well dried and wiped, takes a walk, and brings on reaction by the exercise.

This douche may be infinitely varied with regard to the massage, the temperature, the volume of the waters, or the force and direction of the fall. The massage may be exercised partially, or on the back of the body in general, the head excepted; it may be more or less energetic; it may be accompanied by friction with the hands, or by brushes.

As regards the temperature, the douches may be taken at 44° or 49° C. (nearly 113° Fahr.), as in the bouillons, enfer, and centre; whilst in aux Princes, aux douches du soubassement, it may vary from 16° to 46° C. (from 61° to 119° Fahr.). The bather may pass insensibly from one degree to the other, as he may pass abruptly from an elevated to a low temperature, and *vice versa* (*douche écossaise*).

He may also be subjected to different temperatures at once. He may receive, for instance, hot water on the feet, tepid on the shoulders, and

cold on the head. The bather may receive water on all the body, in torrents or in feeble quantities. This water may fall with force in jets, in sprinklings, or in streams; its force may be diminished by means of curved tubes.

It may be conveyed by pipes furnished with tubes, having larger or smaller openings, or terminated by a sprinkling rose with holes more or less fine.

It may be directed horizontally in the hip douches, from below upward in the perineum douche (*bec de corbin*), or vertically—that is to say, in any direction.

Finally, the pressure of the water may be varied infinitely, as I have shown above.

From this variety in the administration of the douches arises the action which I call *mechanical*, and by which we may produce physiological effects, sometimes stimulating, sometimes sedative, sometimes disturbing, at others revulsive—in a word, which can be modified infinitely.

The douche at a temperature of 34° C. (94° Fahr.) is sedative; the pulse is accelerated by hardly four to five pulsations; the temperature does not vary.

In the hot douche, on the contrary, of 37° and

40° C. (100° to 104° Fahr.), and especially in the vapour baths, the pulse is rapidly accelerated; it increases easily ten, twenty, and even thirty pulsations a minute. The rectal temperature rises also a degree and a half. This action of so exciting a nature ought to be well-known and understood; it should be avoided for all persons who have an affection of the heart, as so frequently happens in cases of rheumatism or gout. This exciting action lasts during the douche; the pulse and the temperature return to the normal state ten or nineteen minutes after its termination, and this the more rapidly the more complete the reaction, the more abundant the perspiration.

We may, therefore, according to the results which we wish to obtain, modify the douche infinitely, and obtain results varying with the affections we have to treat and the complications we have to cure. In speaking of the thermal establishment of Aix, Dr. Macpherson says: "There are, probably, no sulphur baths whose arrangements are so complete as those of Aix."

One of the most remarkable results obtained by the treatment at Aix is that which is produced with regard to the urine. From the commence-

ment of the treatment there ensues a very sensible augmentation in the elimination of the urea and the uric acid. This double elimination is invariably produced, whatever may be the treatment employed (drink, bath, vapour bath), and must play a great part in the cure of rheumatism and gout.

The action of the water of Aix, and the mode of administration being known, it remains for me now to give, as succinctly as possible, a description of the different maladies or affections which may be treated there, and to determine their indications and contra-indications.

In order of frequency the maladies are—

Rheumatism.

Gout.

Sciatica.

Diseases of respiratory organs	{	Laryngitis.
		Pharyngitis.
		Chronic bronchitis.
		Phthisis.

Syphilis.

Surgical affections	{	Fractures.
		Stiffness of tendons.
		Sprains—caries.
		Pseudo-ankylosis.
		Wounds by firearms.
		Diseases of the eye.

Diseases of the uterus, ovaritis, chronic uterine catarrh, dysmenorrhœa, sterility.

Diseases of the skin.

Affections of the nervous system	{ Paralysis, hemiplegia, spinal paralysis, diphtheric paralysis, typhoid paralysis, locomotor ataxy, paralysis from pressure, hysterical paralysis, facial paralysis, chorea, mercurial paralysis, lead paralysis, &c.
Various	
	{ Contraction of the muscles, torticollis, ozæna. { Phlegmasia alba dolens, albuminuria, &c.

RHEUMATISM.

And first, rheumatism is found in all its forms, from simple rheumatoid pains to the most severe arthritis deformans (*rheumatismus nodosus*, rheumatic gout), as well as all the complications which form part of the maladies—neuralgia, sciatica, dyspepsia, gastralgia, pharyngeal and bronchial affections, cardiac affections, &c.

To speak of the action of the waters of Aix in rheumatism is to recall the numerous pamphlets which have been published by all the physicians who have practised at Aix, by all those who have written on thermal establishments.

The physiological properties of the waters of Aix, their temperature, their mode of administration carried to such perfection, explain the just reputation which this establishment has

acquired for the amelioration and cure of rheumatism. The baths, douches, vapour baths and internal administration of the water are utilized against this malady. In general the treatment consists of sixteen or eighteen douches or vapour baths, and four or five ordinary thermal baths ; but it is easily understood how great are the exceptions to this rule. The douche itself varies infinitely, according to the degrees of intensity of the disease, to the time the malady has lasted, to its form, to the strength of the patient, and, above all, according to the complications we wish to avoid, and to which the greatest attention must be paid.

It is the business of the physician to seize with precision all the varied indications, and consequently his part is of great importance in our establishment. He must himself regulate the delicate treatment—often of difficult application—and he is therefore obliged to remain in the establishment to watch over and attend to his patients.

In true chronic rheumatism I have great confidence in the vapour baths, combined with the douches and the ordinary thermal baths. It is with them especially that we obtain those results, sometimes so surprising. But I cannot too strongly

recommend the patients to take every possible precaution in avoiding all causes of chill ; the only means to be adopted in many instances is to use the *maillot*, and be carried home, reserving the simple douches, with the subsequent walk, for the cases in which the rheumatism is slight, and in which the enervated and enfeebled patients cannot or ought not to employ this invaluable aid.

I prefer giving the douche very early in the morning, in order that the invalids may have a long rest between their douche and the breakfast hour. This repose is all the more necessary because the reaction does not occur until about one hour after the douche ; the patient is generally warned of it by a desire to stretch himself in bed, to successively extend all his muscles.

But if it is *useful* to surround the invalid with these precautions in the ordinary form of rheumatism, it is *indispensable* to do so for patients attacked by rheumatismus deformans, osseous or fibrous. It is only by extreme prudence, by continued care, that we can arrive at good results, of more frequent occurrence than is generally believed. For this last rheumatism I prefer the

employment of the douches, tempered to 35° C. (96 Fahr.), with moderate massage, only permitting the articular movements when the osseous surfaces are not deteriorated. These indications have been already perfectly formulated by my colleague, Dr. Bertier, jun. In these cases I always have the patients carried home, recommending their being left a few minutes only in the *maillot*, to avoid extreme perspiration, which I think useless, and even dangerous.

There are, however, some exceptions to this rule. Some patients, although very anæmic and very debilitated, only endure vapour baths well, and are ameliorated by them alone ; but these cases are rare. It is often only after several trials that we are enabled to employ them, and always with the greatest precaution. It is not easy to establish a precise indication or plan in these cases.

In the researches which my colleague, Dr. Monard, and myself undertake, we may succeed in finding, either in the blood, or in the excretions and secretions, a precise indication for this or that mode of treatment.

In this form of rheumatism a tonic regimen, ferruginous preparations, and Challes water to drink, are indispensable aids.

For chronic rheumatism, and, *a fortiori*, for rheumatismus deformans, the amelioration is only perceived one, two, or even three months after the cessation of the thermal treatment. Several seasons are necessary. The patient should not be discouraged after a first trial which has appeared to produce little or no modification ; it is only *with perseverance* that we have arrived at results truly surprising, on which we could hardly calculate. In these cases the patients should return three, and even four, successive years.

I have often convinced myself of the truth of this fact in my hospital practice ; patients not having sufficient money to run from one establishment to another, return to Aix and are cured.

I will not quit the subject of rheumatism without speaking of one of its gravest complications—viz., *cardiac affections*. Of the 419 rheumatic patients treated by me in 1881, twenty-four were affected with aortic or mitral lesions. It is too generally thought that this complication is a counter-indication to the thermal treatment. From my personal experience, after the numerous cases which I have had under my observation for nineteen years, I can affirm the contrary. The

cardiac complications, in so far as they are not too numerous, and the valvular or arterial alterations not too extended, may be ameliorated, or even cured, by a treatment applied with all the prudence necessary in such a case. During three years especially, in which I have studied most particularly the hearts of rheumatic invalids, either by means of stethoscopic or graphic signs, I have been able to secure some remarkable recoveries. Many physicians of Aix had already arrived at the same conclusion, and Dr. Vidal has made it the subject of a special memoir.

In speaking of the treatment of rheumatic gout (rheumatoid arthritis), Dr. Garrod says :—

“The waters I found most beneficial in rheumatoid arthritis are those of Aix-les-Bains, at which place the douche forms a most important part of the treatment.”

GOUT.

For gout I must offer the same remark that I have made on chronic rheumatism. The greatest prudence is to be observed in the treatment of this malady. In general, gouty subjects should not be sent to Aix if they have acute manifestations at short intervals, and espe-

cially patients with tendencies to affections in the internal organs—the heart, the brain, the stomach, the lungs, &c.

On the other hand, the treatment at Aix gives excellent results in chronic gout, often complicated with rheumatism; in painful affections of the articulations, accompanied or not by tophaceous deposits; and, finally, in all the cutaneous manifestations of the gouty diathesis.

In support of my assertion I quote the words of Prof. Garrod, so competent a witness. He says :

“ In gout, Aix treatment has been proved most useful in the following cases :—

“ 1. When gout manifests itself in cutaneous eruptions, especially in the form of psoriasis or eczema, whether combined or not with joint affections.

“ 2. When much passive swelling and stiffness are left after the attacks of articular gout, or in the form of gout not connected with portal congestion, and in which the influence of other thermal waters, as those of Wildbad and Toeplitz, is usually found beneficial.”

The most beneficial applications in these cases are general tempered douches, with very gentle massages and movements; the local vapour douches;

the sulphurous beverages of Marlioz and Challes during the treatment, and the waters of St. Simon, Wals or Vichy at meals, joined to moderate exercise and scrupulous observance of the diet.

If, notwithstanding the care in the treatment employed, attacks should still arise during the course of the thermal treatment, these attacks are accompanied with little pain, are of short duration, and, above all, when once over, they do not return so frequently. The patients come back in another year, satisfied with the small amount of suffering they have had to undergo in the year which followed the thermal remedies.

But the treatment of Aix should be especially prescribed whenever we have to do with the cases, pretty numerous indeed, in which gout and rheumatism are found combined, without its being possible to decide absolutely which of the two maladies predominates.

The curative action of the waters of Aix in the treatment of gout is easy of explanation. Multiplied observations have proved to me that, thanks to the thermal treatment, *intus et extra*, the uric acid and the urea are eliminated in large quantities. The functions of the skin, moreover, are re-established, the cutaneous perspiration

reverts to its normal state, and the patients, placed in a good hygienic condition, can more easily combat the gouty diathesis and recover their primitive health.

Numerous examples of improvement and cure have been cited by Profs. Corrigan and Garrod, and Drs. Brachet, Bertier, and Macé.

The other affections of a rheumatic nature—*neuralgia*, *dyspepsia*, *gastralgia*—are, in general, modified rapidly and completely by the thermal remedies. The swimming baths, the tempered douches, constitute the principal treatment. But in stubborn cases, in neuralgia and gastralgia of long standing, it is necessary to have recourse to the vapour baths, and I have already seen several invalids who were attacked by very painful gastralgia thoroughly cured at Aix by the latter means, after having unsuccessfully undergone treatment in establishments more especially celebrated for the cure of gastric and intestinal affections.

SYPHILIS.

In a work published in 1867, entitled, "Du soufre et des sulfureux dans le traitement de la Syphilis," I have laid down in a precise manner

the sulphurous indications in the treatment of syphilis. The conclusions at which I arrived are the following :—

1. Sulphur and sulphurous combinations do not of themselves cure syphilis, but they have an incontestable influence on the complications of this disorder.

2. By their stimulating action they draw to the skin the syphilitic manifestations, and consequently facilitate the diagnosis and direct the physician in his therapeutics. They act on the organisms, in a course of mercurial treatment, in many ways, by carrying the medicaments to the part where the evil exists—that is to say, by producing the elimination of the mercury through the skin, by opposing the mercurial accumulation, and consequently the accidents which spring from it—diarrhœa, stomatitis, cachexia—and curing them when they have been produced.

3. By the cutaneous irritation which they produce, the sulphurous combinations have many effects. They accelerate the sanguineous and lymphatic circulation; they favourably modify the ulcerations, especially when scrofula is at work; thus dissipate the ganglionic obstructions, and, according to the modern theory of the physiological

rôle of the ganglia, they promote the reconstitution of the blood.

It will be too long to repeat here the experiments which I made at this time; a summary will suffice.

If we pour a solution of hyposulphite, or sulphite of sodium, on a precipitate of albuminate of mercury, this precipitate is immediately dissolved.

The same phenomena must take place in the human body.

In presence of alkaline salts and oxygen the sulphurs absorbed are transformed in the blood into hyposulphite and sulphite; which, when brought into contact with the albuminate of mercury fixed in the body, dissolve them and facilitate their elimination.

I have taken, in fact, two classes of patients, whose urine I have examined every two or three days for a period of twenty days.

1. Patients undergoing at the same time the thermal and mercurial treatment. With these patients the results have always been positive—that is to say, that the mercury has always been found in the urine in an appreciable quantity.

2. Patients who have not taken mercury for one, two, or three months.

I have examined the urine during four or five

days before commencing the sulphurous treatment; I have found no traces of mercury in the urine. I have afterwards prescribed the sulphurous treatment, *intus et extra*, and after a lapse of time varying from four to eight days I have found, with two-fifths of the patients treated, mercury in the urine; which proved, in a manner absolutely certain, that the mercury had accumulated in the body, and that this mercury was eliminated under the influence of the sulphurous treatment.

If on three-fifths of these patients I found no mercury, it is because the elimination had taken place previously, either normally, or because the patients had taken at the same time iodide of potassium, a powerful adjunct in these cases.

The experiments which I have made at this time have been repeated by my colleague, Dr. Brachet, by M. Duvernay, chemist, and by myself, and we are convinced how well the patients could support the specific medicaments, and how easily the mercury was eliminated, whether it had been accumulated in the organism, or taken by the patients in course of treatment.

At the commencement of my career, following tradition in this point, it was only with great

caution that I employed specific medications during the thermal remedy; and, consequently, the results which I obtained were less satisfactory than they might have been, judging from those which have occurred in my subsequent experiments.

Afterwards, prompted by the indications formulated by Professors Charcot and Fournier, and following in that particular the practice of Aix-la-Chapelle, I administered specific medications in strong doses, at the same time as the thermal treatment.

I employ, preferentially, frictions of Neapolitan ointment, of from three or four grammes of iodide of potassium in a dose of four, five and six grammes a day. Thanks to the thermal treatment, the patients endure this medication with the greatest facility. I have seen patients who were completely refractory to all medications in the town, support at Aix the most energetic medicaments in very strong doses; for the invalids who object to frictions I always take care to give the hydrargyric preparations as a substitute, some time after the absorption of sulphurous water—the mixture of this water with the mercurial preparations forming a sulphuret of mercury almost insoluble, and conse-

quently without any action. The vapour baths, the douches with massage and *maillot*, the waters of Aix and Challes taken internally, form the basis of the thermal treatment, and the patients recover rapidly, after having passed long months, or even years, in obtaining elsewhere transient amelioration.

But in order to arrive at this result a relatively long treatment is necessary. The twenty-five or thirty days habitually devoted to a thermal cure are insufficient; a residence of from thirty to forty days at Aix is indispensable if we wish to obtain all the results we are justified in expecting with a double medication—thermal and specific.

On the other hand, twenty or twenty-five days' treatment is sufficient for invalids who take the water as a *touch-stone* (*pierre de touche*), and wish to know if they have been thoroughly cured of their malady. The douches, and particularly the vapour baths, are indicated in this case.

In chronic gonorrhœa I have obtained remarkable cures by combining the internal use of water of Challes with the douches écossaises. Many patients who, after having for several months, and even years, tried in vain the

different treatments employed in these stubborn cases, have found the discharges disappear completely after a course at Aix.

ARTICULAR AFFECTIONS.

All the non-acute articular affections, from simple hydrarthrosis and arthritis to the gravest maladies of the large articulations (white swellings, coxalgias), are successfully treated at Aix. The means at our disposal are indeed remarkable; but that which renders incontestably the greatest service is the local vapour douche, with massages and movements employed with the utmost prudence.

In these affections medical intervention is indispensable to direct the *doucheurs* in the operations; the *massages*, the movements especially, must be watched with the greatest attention; they must even be always avoided in articular lesions of the large articulations (coxalgia, for example). I therefore recommend the *doucheurs*, in the lessons which I give them every year, not to touch these articulations without great prudence and the express direction of the physician.

I dwell on the necessity of this medical intervention, for if the waters of Aix have sometimes been the occasion of accidents, it is because the

patient had transgressed the formal orders of the physician ; but, on the other hand, well-regulated, well-executed treatment gives excellent results, and I know many invalids who had come to Aix with almost complete ankylosis, and left partly or wholly able to move the affected joints.

For less serious affections—hydrarthrosis, dry arthritis—the cure is the rule. One or two seasons suffice in general ; but this cure never happens during the treatment itself, it only comes in the two or three months which follow it.

SCIATICA.

The reputation of the waters of Aix for the cure of sciatica is ancient and well-deserved ; the results obtained, even with patients who have tried in vain all other medicaments prescribed in such cases, are truly remarkable. Dr. Demeaux has published several observations of them in the *Lyon Médical*. The means employed are various—the bath, the stove, the local vapour douche and general douche, are utilized by turns. I prefer the application of the douches with vapour baths, interposing every three or four days either a bath or a local vapour douche. Although the massages have been extolled for sciatica, I have been accustomed to permit the affected leg to be

but little douched, unless in exceptional cases of long standing. This was also the recommendation given by Dr. Despine.

Some patients cannot support either vapour baths or douches; in these cases the tempered baths have furnished excellent results. In the first work published about Aix the most remarkable cases of cure were precisely those of sciatica, and douches did not exist at that time.

PHARYNGITIS AND LARYNGITIS.

A great number of invalids suffering from laryngeal and pharyngeal affections are treated every year in our establishment by the combination of the treatments of Aix and Marlioz. These affections are mostly a complication of a rheumatic diathesis; thus, the general treatment is the most powerful modifier. But the addition is indispensable, either of the inhalations of Aix, or the pulverizations of Marlioz, and of the administration of the waters of Marlioz and even Challes. The variety in the apparatus existing in the two establishments of Aix and Marlioz, and the difference in the qualities of the waters, enable the physician to vary the treatment infinitely, according to the medical indications.

BRONCHITIS.

The number of patients suffering from bronchial affections is relatively small at Aix. Some surprise may be felt at this, in an establishment where the variety of sulphurous springs permits the application of treatment with all the requisite prudence. The medical body generally sends few phthisical patients to Aix, because our *characteristic* is the douche. I think this exclusion is little to be justified; the warm inhalations of Aix, the cold inhalations of Marlioz, and the drinks of Marlioz and Aix, afford us real and serious advantages, especially when we consider the mildness of our climate, and the few atmospheric variations which we undergo in comparison with the sulphurous establishments in the Pyrenees.

My colleague, Dr. Brachet, and myself, have published descriptions of remarkable cures, in well-verified cases of tuberculosis. Analogous observations have been cited and published by Drs. Bertier, sen., and Berthet.

But where the treatment of Aix and Marlioz combined gives the most complete and certain results is in that form of chronic bronchitis produced by the hypertrophy of the bronchial glands.

It is also so with children who, either from their hereditary antecedents, or from the facility with which they catch bronchitis and laryngitis, are at every instant liable to the development of bronchial tuberculosis, which will be so difficult to cure later on.

The swimming baths, the cold inhalations of Marlioz—in which, besides sulphuretted hydrogen, there is a little iodine—the beverage of Marlioz, or that of Challes, are, so to say, *sovereign* remedies in these cases. I cannot too strongly urge physicians to send children to Aix who are in these conditions.

The most propitious time to make this treatment is the end of August, the month of September, and even of October. It has the double advantage of coinciding with the scholastic vacations, and permitting, as the weather is not too warm, walks and excursions being made in our country, so picturesque and varied.

AFFECTIONS OF THE UTERUS.

Chronic affections of the uterus, amenorrhœa, metritis, chronic catarrh, and fungous growths of the uterus, are rapidly ameliorated by the treatment of Marlioz and Aix combined. The greater part of these affections often accompany

rheumatism. They are most frequently a symptom only, which is modified with rheumatism, and is cured by the general treatment well applied. Numerous instances of cure have been cited by Drs. Despines, Brachet, and Bertier, jun. I have myself met with a great number in my own practice.

Prolonged sulphurous baths, the sulphurous beverages of Marlioz and Challes, and vaginal injections should be prescribed, combined with douches écoussaises, or douches en cercle, intended to give tone and vigour to patients weakened by uterine pains or losses.

Uterine injections ought to be taken with great care. In general I forbid the apparatus of strong pressure, and I give the preference to the simple receptacle, furnished with a caoutchouc tube, which may be placed at different heights, and thus yield a pressure determined by the physician—a pressure which cannot vary.

In subacute cases I often employ the wired speculum (*grillagé*), which allows the application of a veritable uterine bath.

These uterine inflammations, whether primitive, or resulting from obstetrical operations, are most favourably modified by our waters; the pains are assuaged, the uterus diminished in volume, the

catarrh, which increases during the treatment, diminishes and disappears, and thence the possibility of *pregnancies* following the thermal treatment—pregnancies often for a long time fruitlessly expected.

SURGICAL AFFECTIONS.

Accidents resulting from contusions, fractures, simple wounds, or wounds from firearms, are very favourably treated at Aix. The results which we obtained with the wounded in the war of 1870, and those which we obtain every day, are truly remarkable. And this fortunate action is easily understood when we reflect on the powerful means at our disposal. Douches with *massage*, local vapour douches especially, are always employed in these cases. The action of the water and of the thermal vapour, joined to that of the massage, always give excellent results; the pains diminish, and even disappear altogether; the joints become more supple, and, if the ankylosis is not complete, the articulations resume their primitive movements. But in the treatment of these affections great attention must be paid to the application of the massage; it may, and should be, continued long; there can even be two *séances* a day—one at the establishment with the thermal water, one at home with

a dry massage. This latter may be continued after the thermal remedy.

The same remark must be made with regard to *torticollis* (stiff-neck), whether produced by an alteration of the muscle, or of the bone. The local vapour baths, with massage, performed very carefully, the general douches and swimming bath, bring about a recovery almost universally.

DISEASES OF THE SKIN.

The affections of the skin treated at Aix are not numerous—the feeble mineralization of our waters, and the stimulating action, which does not permit their employment in so prolonged a manner as in other thermal establishments, explaining this relative rarity ; nevertheless, all cutaneous arthritic affections are well modified at Aix, either by baths or by vapour baths. We have, moreover, a powerful aid in the water of Marlioz, which, employed as a bath, and taken as a beverage, enables us to carry out the indications of sulphurous springs strongly mineralized. It is, above all, for strumous affections that Marlioz is of great utility for us. By joining to the treatment the water of Challes, taken internally, or added to the baths of Marlioz and Aix, we can obtain all the results to be expected from sulphur, internally and externally.

DISEASES OF THE NERVOUS SYSTEM.

The disorders of the nervous system more particularly treated at Aix are—paralysis resulting either from poisoning by metals, mercurial palsy or tremor, and lead paralysis; from blood poisoning consequent on grave infectious maladies, diphtheria, small-pox, typhoid fever, typhus &c.; paralysis *a frigore*, whether a whole member be attacked, or more particularly a special nerve; facial paralysis (or Bell's paralysis), paralysis of the third nerve, motor oculi, &c.

To these paralyses must be added the writer's cramp, wasting palsy or progressive muscular atrophy, and infantile spinal paralysis.

In all these maladies the employment of the waters in baths, and especially of douches combined with the application of electricity, gives remarkable results, easily understood when we consider the skill with which the hydrotherapeutic operations are carried out in our establishment.

In writer's cramp and progressive muscular atrophy the results obtained are in general very slight, but, on the other hand, I have been able to note remarkable results in infantile spinal paralysis after several seasons passed at Aix-les-Bains.

In mercurial or lead poisoning, besides the

reconstituting action of the douches and of electricity, a rapid elimination of the metals is obtained; consequently the patient is relieved from the primary cause of the evil.

In the hemiplegia consequent on cerebral hæmorrhage, or on a syphilitic tumour of the brain, the results obtained are also most satisfactory; but in these cases great prudence must be observed in the employment of the baths and douches. Preference should be given to douches largely aerated—those in which the pressure of water is least strong, so as to avoid all possible causes of excitement in the circulating system.

For hemiplegia produced by cerebral hæmorrhage, the most propitious moment to send the invalid to Aix is the month which follows the attack, when the resolution and reabsorption of the clot of blood begin to take place. Thanks to the waters, this resolution is more rapid and more complete; the limbs recover their movements with some rapidity, either wholly or partially.

For the hemiplegia produced by syphilitic tumour it is necessary to give, at the same time, the specific treatment in large doses, in order to avoid acute symptoms which would arise without its employment.

DISEASES OF THE SPINAL CORD.

The two principal diseases of the spinal cord treated at Aix are—*spinal irritation*, and locomotor ataxy.

As to the former, it is frequently the consequence of a congestion of the integuments of the marrow produced by a chill. The douches and the baths have in these cases a very marked action, proceeding from the revulsion operated on the skin.

For the latter disease it is known that no cure can be obtained ; but we may get appreciable amelioration by combining the thermal treatment with electricity, and by firing (*pointes de feu*) along the vertebral column.

We see every year patients who, after fruitless experiments tried in other thermal establishments, come to Aix and obtain substantial advantages from the thermal treatment. The thermal water should be employed with great caution in these maladies ; it is rather the thermal hydrotherapia which is applied in these cases than a real thermal treatment.

I have already spoken of the different kinds of neuralgia, lumbago, pleurodynia, sciatica, &c. and shall not return to them. I must, however, insist on the utility of the thermal treatment

in chronic chorea. This disorder is often the consequence of rheumatism; and the action of the water, combined with the mechanical action of the douches, explains perfectly the favourable results obtained.

With regard to the other kinds of neuralgia dependent on hysteria, the thermal waters of Aix are not to be employed; and if we have every year to attend to patients suffering from this malady, it is because we can at Aix apply the hydrotherapeutic treatment with cold water. The mildness of the climate, the varied excursions which can be made, and the numerous distractions to be found in our town, form useful agents in the cure of this ailment.

For the other affections—*glycosuria*, *albuminuria*, *lead colic*, *phlegmasia alba dolens*, &c.—they do not appertain to the characteristic specialities of Aix; but it is very intelligible that, with the varied means at our disposal, we can obtain good results, by re-establishing the functions of the skin, and by improving the hygienic conditions.

But in all these cases the physician must use much caution in the treatment. In albuminuria especially, when the renal lesion is of long standing, and the albumen is abundant, it is

necessary to abstain from thermal treatment, and to reserve this latter for albuminuria *a frigore*, which is greatly ameliorated by the thermal hydrotherapeutics, but always under the condition of being surrounded by all the hygienic precautions of which I have previously spoken.

For many of the maladies treated at Aix there is an invaluable aid, which I employ frequently, and which renders great service—it is *electricity*. Continuous and interrupted currents are alternately employed according to the indications, whether to calm pains, to revive muscular contractility or combat long-standing contractions, to assist the nutrition or the reconstitution of atrophied muscles, and, finally, to stimulate the absorption of old articular swellings. These means ought to be used with a certain reserve, a too-extended employment would, in my opinion, create a confusion by not permitting the establishment in a precise manner of the real action either of the treatment of Aix or of the electric treatment.

The waters of Aix have of themselves a powerful action; the results obtained by them are sufficiently remarkable without employing elec-

tricity otherwise than as a useful adjunct; sometimes, indeed, necessary, but always *secondary*, in the course of the thermal treatment.

The thermal establishment of Aix is open all the year, but the most propitious periods to follow the treatment are the months of April, May, June, July, August, September and October. However, very many patients come also in the months of March and November.

In general, and as regards the English in particular, they should avoid the months of July and August, the heat being then very great.

The patients who after treatment must return to England, will do well to come to Aix at the commencement of the season, during the months of April, May or June, so as to profit by the summer season in England in order to complete the treatment under the influence of warmth. It is the same with those who wish to pass their summer in Switzerland, or any other mountainous country. On the contrary, those who can pass their winter in milder climates, as the South of France or Italy, should come to Aix in the months of September, October, and even November.

APPENDIX.

IN the course of the work I have often spoken of the waters of Marlioz, St. Simon, and Challes. They form a part almost of the treatment of Aix, their use being so frequent here; and therefore I proceed to give a slight sketch of the arrangements, and the composition of the waters.

MARLIOZ.

The establishment of Marlioz is situated three-quarters of a mile south of Aix, being united to this station by a magnificent shaded promenade. It is built in a very pretty park, which is almost an annex of Aix.

The waters are charged with sulphur and soda, and slightly with iodine and bromine, as shown by the following analysis of M. J. Bonjean:—

Temperature	57° Fahr.
In 1000 grains of water—	
Sulphuretted hydrogen	6.70 gr.
Carbonic acid	4.64 "
Iodine	0.0001944 gr.
Bromine	0.000015 "
Sulphide of sodium	0.067 "
Sulphate of soda	0.029 "
„ of lime	0.002 "
„ of magnesia	0.018 "

Chloride of sodium	0·018 gr.
„ of magnesium	0·014 „
Carbonate of lime	0·186 „
„ of magnesia	0·012 „
„ of soda	0·040 „
Silex	0·006 „
Carbonate of iron	0·013 „
„ of manganese	0·001 „
Sulphate of iron	0·007 „
Glairine	indeterminate quantity.
Loss	0·017 gr.
Total	0·426 gr.

The Establishment at Marlioz possesses :

A very fine pump room.

Two large inhalation rooms.

Nine private rooms for baths.

A cold douche.

Two douches ascendantes.

Two complete apparatuses for atomised and spray inhalation.

Four douches de siège et ascendantes.

I have already spoken of the frequent use made of the waters of Marlioz in the treatment at Aix. I will not recur to the subject; the indication of those waters has been defined in a work written by my colleague, Dr. Macé.

In general they are employed in all pharyngeal, laryngeal and bronchial affections; in chronic affections of the uterus; in affections of the skin;

in short, in all affections in which sulphur in strong doses is prescribed.

These waters, being at the same time alkaline, they are a powerful aid whenever we have to treat affections arising from gouty and arthritic diatheses.

ST. SIMON.

The waters of St. Simon are slightly alkaline and magnesian. They render us great service in affections in which the sulphurous waters are judged too energetic, and when the gouty or arthritic phenomena have a tendency to act upon the kidneys—nephritis, gravel, renal calculus, or colic, &c.

The Establishment is situated half a mile from Aix, the water being exclusively employed as a beverage.

ANALYSIS.

In 1,000 grains of water :—

Carbonate of lime	0'23521	gr.
" of magnesia	0'16162	"
Chloride of magnesium	0'00029	"
Sulphate of magnesia	0'01124	"
" of potash	0'00391	"
" of soda	0'00889	"
Silicio acid	0'00825	"
Alum, iron	0'00172	"
Organic matter	0'02062	"
Loss	0'002626	"
Total	0'469216	"

CHALLES.

The waters of Challes have acquired a great reputation, especially of late years. They are, in fact, the most sulphurous waters in Europe, and contain at the same time a notable quantity of iodide and bromide of potassium.

We have seen that great use of them is made at Aix in all maladies arising from scrofulous, arthritic and gouty diatheses, and most particularly syphilis; in short, in all affections where sulphur is utilized.

Many patients go to follow the treatment at the establishment of Challes itself, placed in one of the most picturesque parts of Savoy, and enjoying every desirable comfort, both with regard to hydrotherapeutic arrangements and to the excellence of the hotels and the Casino.

Challes is situated three miles from Chambéry, and consequently about twelve miles from Aix-les-Bains.

ANALYSIS OF THE MINERAL WATERS OF CHALLES.

In 1,000 grains of water:—

Sulphur (corresponding to free sulphuretted hydrogen)	0·0140 gr.
„ (corresponding to combined sulphuretted hydrogen)—	
„ as bisulphuret	0·0465 „
„ as monosulphuret	0·1128 „
„ probably as polysulphuret	0·0189 „
„ as hyposulphite	0·0050 „
Sulphuric acid	0·0390 „
Silicic „	0·0092 „
Carbonic acid, free or as a bicarbonate	0·1162 „
„ „ combined	
Phosphoric acid	0·00057 „
Nitric „	0·0011 „
Chlorine	0·0870 „
Bromine	0·0016 „
Iodine	0·0089 „
Soda	0·4749 „
Potash	0·0057 „
Ammonia	0·0022 „
Lime	0·0856 „
Magnesia	0·0021 „
Alumina	0·00022 „
Iron	0·00039 „
Manganese	positive traces.
Cobalt	traces.
Copper	very positive traces.
Lead	„ „
Antimony	traces
Arsenic	0·000007 gr.
Dialysed organic matter	abundant.
Non-dialysed „ „	very abundant.
Total	1·023887 grs.







